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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/849,016	05/20/2004	Shinichi Fukada	119798	7125
25944	7590	05/05/2005	EXAMINER	
OLIFF & BERRIDGE, PLC			GEBREMARIAM, SAMUEL A	
P.O. BOX 19928			ART UNIT	PAPER NUMBER
ALEXANDRIA, VA 22320			2811	

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/849,016

Applicant(s)

FUKADA, SHINICHI

Examiner

Samuel A. Gebremariam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-7 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/24/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of the Group I invention, claim(s) 1-7, filed on 3/8/2005, is acknowledged. The traversal is on the ground(s) that examination of all of the pending claims together does not place a serious burden on the Examiner. This is not found persuasive.

A restriction requirement between one set of product claims and a set of process claims was issued in the Office action mailed on 2/9/2005. "Section 121 [of Title 35 USC] permits a restriction for 'independent and distinct inventions,' which the PTO construes to mean that the sets of claims must be drawn to separately patentable inventions." See *Applied Materials Inc. v. Advanced Semiconductor Materials* 40 USPQ2d 1481, 1492 (Fed. Cir 1996)(Archer, C.J., concurring in-part and dissenting in-part). A product and the process of making the product are "two independent, albeit related inventions." See *In re Taylor*, 149 USPQ 615, 617 (CCPA 1966). "When two sets of claims filed in the same application are patentably distinct or represent independent inventions, the examiner is to issue a restriction requirement." See *In re Berg*, 46 USPQ2d 1226, 1233 n.10 (Fed. Cir. 1998).

The examiner, in issuing a restriction requirement, must demonstrate "one way distinctiveness." *Applied Materials Inc.* at 1492. As stated within the restriction requirement, "inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different

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process (MPEP § 806.05(f))." In this application, the examiner restricted the product claims from the process claims on the grounds that "the product as claimed can be made by another and materially different process such as a process of forming the ferroelectric capacitor without the process step requiring the use of a mask such as selectively depositing the lower electrode layer," and that, as a result, a restriction was necessary.

In addition to one way distinctiveness, the examiner must show "why it would be a burden to examine both sets of claims." *Applied Materials Inc.* at 1492. "A serious burden on the examiner may be *prima facie* shown if the examiner shows by appropriate explanation either separate classification, separate status in the art, or a different field of search." MPEP 803. An explanation was provided in the restriction requirement. Specifically, in addition to being distinct, the examiner indicated that restriction is proper because the product claims and the process claims "have acquired a separate status in the art."

The criteria of distinctness and burdensomeness have been met, as demonstrated hereinabove. Accordingly, the restriction requirement in this application is still deemed proper and is therefore **made FINAL**.

Claims 8-10 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed the response to the last office action.

Drawings

2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.
3. Figures 5A-5D should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Specification

4. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation of "using a mask that forms and processes any one of a lower electrode" as recited in lines 3-4 of claim 1, is unclear as to what it means. While it is true that a mask can be used for forming and processing different layers, it is unclear how a mask can form and process a layer.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by admitted prior art (APA)

Regarding claim 1, As best the examiner is able to ascertain the claimed invention, APA teaches (figs. 5A-5D) a method for manufacturing a semiconductor device, comprising: defining a region where a ferroelectric capacitor is formed by using a mask (M100) that is used to form and process any one of a lower electrode layer (200A) and an upper electrode supporting layer (200C) prior to forming an upper electrode layer (200D) (refer to paragraph [0004]; the lower electrode layer extending in a first direction (column (horizontal) direction, [0004]) and the upper electrode layer extending in a second direction (row (vertical direction) [0008]) are-being provided on a semiconductor substrate (paragraph [0004] line 5) with a ferroelectric layer (200B) and the upper electrode supporting layer therebetween (200C), and the ferroelectric capacitor (layer) being disposed at an intersection (paragraph [0009]) of the lower electrode layer and the upper electrode layer.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Kim, US patent No. 5,801,410.

Regarding claims 2 and 3, APA teaches substantially the entire claimed structure of claim 1 above except explicitly stating that a dimension in the first direction of a region where the ferroelectric capacitor is formed being larger than the a width of the upper electrode layer or a dimension in the second direction of a region where the ferroelectric capacitor is formed being larger than a width of the lower electrode layer.

Kim teaches (figs. 3 and 4) the formation of a ferroelectric capacitor where the lower electrode (9) is shown wider than the upper electrode (13). Viewing from the top (column direction) the lower electrode appears wider than the top electrode.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the width of the top electrode in relation to the column direction as taught by Kim in the process of APA in order to form a ferroelectric capacitors with improved reliability (col. 2, lines 38-40).

Furthermore parameters such as width in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device characteristic during fabrication.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the dimension in the second direction of a region where the ferroelectric capacitor is formed larger than the a width of the lower electrode layer as claimed in order to form a ferroelectric capacitors with improved reliability.

Allowance

11. Claims 4-7 are allowed.

Reason for allowance

12. The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or suggest, singularly or in combination at least the limitation of "depositing a lower electrode layer forming mask on the ferroelectric layer forming film in the presence of the upper electrode supporting layer forming mask; forming a ferroelectric layer and a lower electrode layer in a region where the ferroelectric ... forming an insulating layer on a whole upper surface of the semiconductor substrate from which the upper electrode supporting layer forming mask and the lower electrode layer forming mask have been removed; exposing an upper surface of the upper electrode supporting layer that is to be the region where the ferroelectric capacitor is formed to an upper surface of the insulating layer; and forming an upper electrode layer extending in a second direction on the insulating layer to which the upper surface of the upper electrode supporting layer has been exposed so as to include the region where the ferroelectric capacitor is formed" as recited in claim 4.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

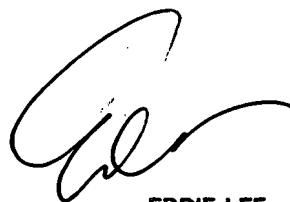
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References B and C are cited as being related to ferroelectric capacitor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A Gebremariam whose telephone number is (571) 272-1653. The examiner can normally be reached on 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAG
April 27, 2005



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